

Toxoplasmosis

WHAT IS TOXOPLASMOSIS?

Toxoplasmosis is a disease that results from infection with the parasite *Toxoplasma gondii*. In the eye, *Toxoplasma* infections frequently cause significant inflammation and subsequent scarring which may temporarily or permanently impair vision. Infection can be transmitted through pregnant mothers to their baby (congenital) or acquired by eating contaminated foods or undercooked meat. Worldwide, toxoplasmosis is the most common cause of inflammation in the back of the eye. Twenty-two percent of children in the United States under 12 years of age have evidence of previous infection with toxoplasmosis, although the majority never had symptoms.

WHAT IS CONGENITAL TOXOPLASMOSIS?

Congenital toxoplasmosis is transmitted from the mother to the fetus across the placenta during pregnancy. Newly infected women transmit the *Toxoplasma* organism to a fetus if they are infected during pregnancy or just before pregnancy. This can happen even if the mother does not have any signs or symptoms of infection. Infection in the first trimester of pregnancy carries a lower rate of transmission to the fetus than infection in the third trimester, but the disease consequences are more severe if it occurs in the first trimester. Intrauterine transmission occurs in about 1/3 of pregnancies of acutely infected women. Medications such as spiramycin given in early pregnancy can reduce the rate of infection from mother to fetus by half. Congenital infection occurs in the United States in about 1/1,000 to 1/10,000 live births, (or 500 to 5000 cases per year) and usually results in retinal scars in both eyes. Strabismus, microphthalmia, cataract, optic atrophy and nystagmus may also be associated with congenital cases.



Fig. 1: Normal retina



Fig. 2: Congenital toxoplasmosis scar

HOW IS TOXOPLASMOSIS NEWLY ACQUIRED BY AN ADULT?

The Toxoplasma organism resides in the intestinal tracts of many animals, particularly cats. Infectious organisms are shed in cat feces which contaminate the soil and water. Animals, such as sheep and cattle may become infected when grazing and can pass the disease to human eating undercooked meats. Infection risk can be minimized by practicing good hygiene including hand washing (especially before preparing or eating food) and avoiding raw or undercooked meat and unwashed vegetables. Countries with humid, hot environments have a higher number of cases. It is recommended that pregnant women avoid handling cat litter boxes, cat feces, sandboxes, and any insects exposed to cat feces (cockroaches, flies, etc.). Immunocompromised patients (including those with AIDS, cancer, or those taking immunosuppressive drugs) are at greater risk if they acquire toxoplasmosis as the disease is more severe, and may even be fatal.

WHAT ARE THE SYMPTOMS OF NEWLY ACQUIRED TOXOPLASMOSIS IN AN ADULT?

More than 80% of newly infected persons experience no symptoms, and are unlikely to be aware of the infection. Symptoms may occur following an incubation period of one to two weeks after exposure and include mild fever, swollen glands, malaise, muscle and/or joint pain, headache, sore throat, and skin rash. Eye symptoms vary, but may include blurred vision or floaters during active disease. The diagnosis can be confirmed by detecting antibodies to Toxoplasma in the blood. Swelling of the liver or spleen may be noted, and in rare cases the lungs, brain, liver, or heart may be involved. The condition usually resolves without treatment within a few months.

HOW IS ACQUIRED TOXOPLASMOSIS TREATED?

Most cases are generally self-limited, and rarely require treatment. If involvement of the internal organs is severe, treatment with antibiotics is considered. If the infection is recognized during pregnancy, treatment may be used to reduce the risk of maternal-fetal transmission. If vision is threatened, treatment with pyrimethamine, sulfadiazine and corticosteroids may be started. Disease reactivation frequently occurs even with treatment.



Fig. 3: Acquired Toxoplasmosis, active infection

WHAT ARE THE SIGNS AND SYMPTOMS OF CONGENITAL TOXOPLASMOSIS?

Most cases of congenital toxoplasmosis are asymptomatic, and initially go unrecognized. Severe cases resemble other acute intrauterine infections such as rubella or cytomegalovirus. Low birth-weight, hydrocephalus, prematurity, seizures, enlargement of liver or spleen, and jaundice may occur. Evidence of retinal infection may be found in 75-80% of known infected babies. The disease affects both eyes in 85% of cases.

WHAT HAPPENS TO THE EYES OF BABIES BORN WITH CONGENITAL TOXOPLASMOSIS?

The infection causes inflammation of a small patch of retina which typically spontaneously resolves [See figures 1 and 2]. However, the infection can leave a localized scar (retina and underlying choroid) which contains the Toxoplasma organism in an inactive, encysted form. The chorioretinal scars do not affect vision unless the scar involves the central portion of the retina (the macula).

WHAT ARE THE LONG-TERM CONSEQUENCES OF CONGENITAL OCULAR TOXOPLASMOSIS?

The chorioretinal scars of congenital ocular toxoplasmosis are generally not active. However, the encysted *Toxoplasma* organisms can reactivate causing inflammation, pain, redness, sensitivity to light, blurred vision, and increased intraocular pressure. Examination during reactivation reveals a cloud of white blood cells overlying the whitened patch of inflamed retina. In severe cases, the view into the eye is quite cloudy, and the underlying acute inflammation can be only dimly perceived.

WHAT ARE THE TREATMENT OPTIONS FOR REACTIVATION OF OCULAR TOXOPLASMOSIS?

Mild cases which do not threaten the central retina (the macula) may resolve without treatment. In more severe cases, the duration of the inflammatory episode can be reduced by treatment with various combinations of antibiotics (pyrimethamine, sulfadiazine, azithromycin, trimethoprim-sulfamethoxazole or clindamycin with supplemental folic acid). Patients with vision threatening lesions may be placed on preventative antibiotics (trimethoprim-sulfamethoxazole), but this must be balanced with the side effects caused by those antibiotics. Steroid eyedrops or systemic steroids may be used to further reduce the inflammation.

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